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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,902	06/28/2002	Sammy Mok	NNEX 0004	5223

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GLENN PATENT GROUP  
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EXAMINER

CLARK, JASMINE JIHAN B

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/069,902

Applicant(s)

MOK ET AL.

Examiner

Jasmine Clark

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-111 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-20 and 27-85 is/are allowed.
- 6) ☒ Claim(s) 11, 21, 23-26, 86 and 106 is/are rejected.
- 7) ☒ Claim(s) 22 and 87-105 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☒ Other: See Continuation Sheet.

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Continuation of Attachment(s) 6). Other: Note that the references provided by the Applicants have been reviewed and considered. However, Applicants Must submitted PTO-1449 for the Examiner to initial.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. Claims 23-26, and 106-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 23, line 2, "a electrically insulative..." is incorrect. It should be --an insulative...--.

In claim 106, line 2, change "an" to --a-- between "having" and "first surface".

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21 and 86 are rejected under 35 U.S.C. 102(b) as being anticipated by Fogal et al. (US 5,905,305).

Fogal et al disclose a device comprising a compliant wafer substrate (see Fig. 1) having a first surface and a second surface; and a plurality of chip scale packages adhesively attached to the first surface (see column 2, line 15) of the compliant carrier wafer substrate; each of the chip scale packages comprising an integrated circuit die comprising a substrate having a first surface and a second surface, an integrated circuit device, and a plurality of integrated circuit contacts 15, 33 (see Fig. 2) located on the

first surface and electrically connected to the integrated circuit device. Note, in Fig. 1 numeral 17 is a system board.

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***Allowable Subject Matter***

3. Claims 22, 87-105 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claims 1-20, and 27-85 are allowed.

The following is an examiner's statement of reasons for allowance:

a) An apparatus, comprising:

an integrated circuit die comprising a substrate having a first surface and a second surface, and integrated circuit, and a plurality of integrated circuit contacts located on the first surface and electrically connected to the integrated circuit;

a plurality of stress metal springs electrically connected to the integrated circuit contacts, the plurality of stress metal springs comprising a plurality of metal layers at least having different initial levels of stress, the stress metal springs defining a loop structure which is rotated by an effective rotation angle away from the first surface of the integrated; and

a polymer layer substantially covering the first surface of the integrated circuit and a portion of each of the plurality of stress metal springs, such that a portion of the

loop structure of each of the plurality of stress metal springs extends beyond the polymer layer as set forth in claim 1.

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b) A processor, comprising the steps of:

providing a sacrifice substrate; establishing a plurality of metal layers on the sacrificial substrate, at least two of the metal layers having different levels of stress; releasing a portion of the plurality to form a non-planar loop structure which is rotated by an effective rotation angle away from the sacrificial substrate; establishing a polymer layer over the sacrificial substrate, the plurality of metal layers, and the formed non-planar loop structure; removing a portion of the established polymer layer to expose a portion of the formed non-planar loop structure; and removing the sacrificial substrate as set forth in claim 27.

c) A contactor, comprising:

a substrate having a first surface and a second surface; and a plurality of conductive vias extending from the surface to the second surface; a plurality of stress metal springs electrically connected to the vias, the plurality of stress metal springs comprising a plurality of metal layers, at least, at least two of the metal layers having different initial levels of stress, the stress metal springs defining a loop structure which is rotated by an effective rotation angle due the different initial levels of stress away from the first surface of the substrate, wherein each of the plurality of stress metal springs further comprises a primary plating layer which substantially covers the loop structure as set forth in claim 46.

d) A contactor, comprising:

a substrate having a first surface and a second surface, and a plurality of conductive vias extending from the surface to the second surface; a plurality of stress metal springs electrically connected to the vias, the plurality of stress metal springs comprising a plurality of metal layers, at least, at least two of the metal layers having different initial levels of stress, the stress metal springs defining a loop structure which is rotated by an effective rotation angle due the different initial levels of stress away from the first surface of the substrate; and a polymer layer substantially covering the first surface of the substrate and a portion of each of the plurality of stress metal springs, such that a portion of the loop structure of each of the plurality of stress metal springs extends beyond the polymer layer as set forth in claim 53.

e) A process, comprising the steps of:

providing a contactor substrate having a first surface and a second surface, and a conductive via extending from the first surface to the second surface;

establishing a plurality of metal layers on the contactor substrate in electrical contact with the via, at least two of the metal layers having different initial levels of stress;

releasing a portion of the plurality of the plurality of layers to form a non-planar loop structure which is rotated by an effective rotation angle due to the different initial layers of stress away from the contactor substrate; and

forming the support substrate over the contractor substrate and partially over the formed non-planar loop structure as set forth in claim 67.

f) A system, comprising:

Art Unit: 2815

a compliant carrier having a first surface and a second surface;

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~~at least one integrated circuit device having a lower surface and an upper~~  
surface, the lower surface adhesively attached to the first surface of the compliant carrier, each of the at least one integrated circuit a plurality of electrical connections on the upper surface;

a system board having a bottom surface and a top surface, and a plurality of electrical conductors extending between the bottom surface and the top surface;  
and

a plurality of electrically conductive connections between each of the plurality of electrical connections on the upper surface of each of the at least one integrated circuit device and each of the electrical conductors on the bottom surface of the system board as set forth in claim 86.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***References Cited***

4. The references of interest are cited: similar to Fogal et al. (US 5,905,305) are Yasunaga et al. (US 6,544,814 B1), Eguchi et al. (US 2003/0071348 A1), and Hashimoto (US 2003/0075975 A1), and VAL et al. (WO 94/25987).



Art Unit: 2815

***Field of Search***

~~5. Note that: this Application 10/069,902 was searched, in class 257, subclasses~~  
750, 758, 751, 778. 691, 690, 776 in view of the limitations of the claimed invention. A  
full search on EAST (USPAT, US-PGPUB, JP, EP, Derwent, IBM TDB) was done, and  
no references could be found.

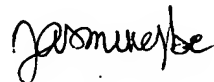
***Telephone Inquiry Contacts***

6. Any inquiry concerning this communication or earlier communications from the  
examiner should be directed to Jasmine Clark whose telephone number is (703)  
308-4857.

The examiner can normally be reached on From M-F. If attempts to reach the  
examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can  
be reached on (703) 308-1690. The fax phone numbers for the organization where this  
application or proceeding is assigned are (703) 308-7722 for regular communications  
and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or  
proceeding should be directed to the receptionist whose telephone number is (703)  
308-0956.

jjbc/06/24/03

  
Jasmine Clark  
Primary Examiner  
AU 2815